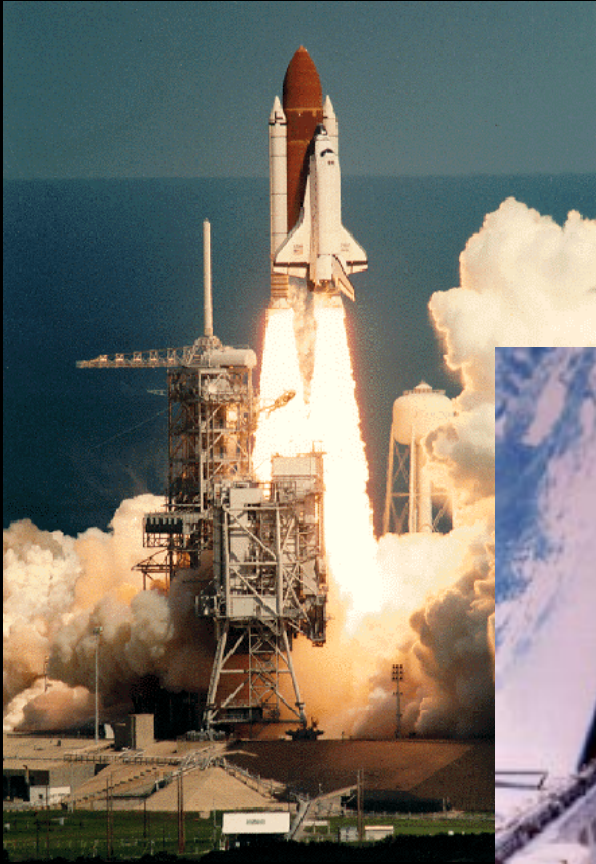


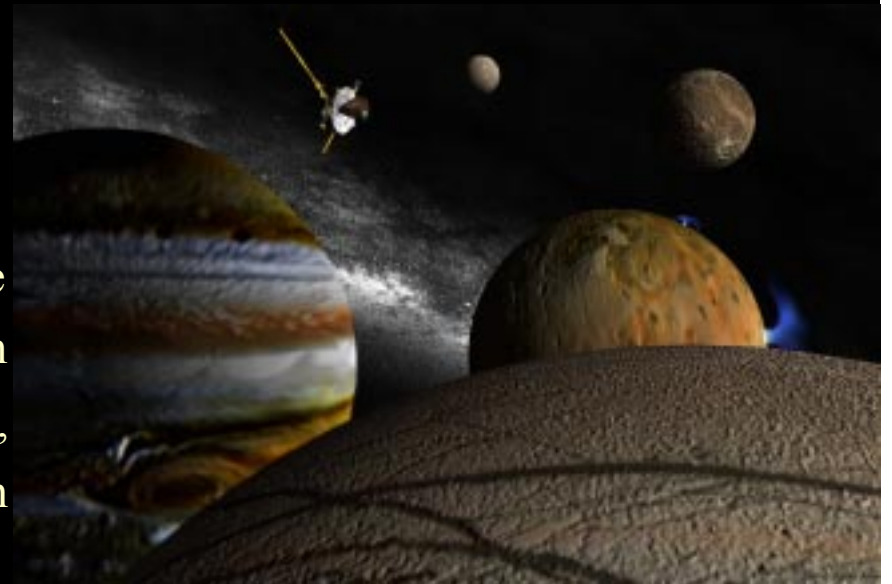
# THE GALILEO MISSION



◀ Launched in 1989 aboard the Space Shuttle Atlantis, the Galileo spacecraft arrived at Jupiter on December 7, 1995. Named for the discoverer of Jupiter's four largest moons, Galileo has been studying Jupiter's atmosphere, magnetic environment, and moons since its arrival. The discovery of volcanoes on Io was first made in 1979 during the Jupiter flybys of the Voyager spacecraft.

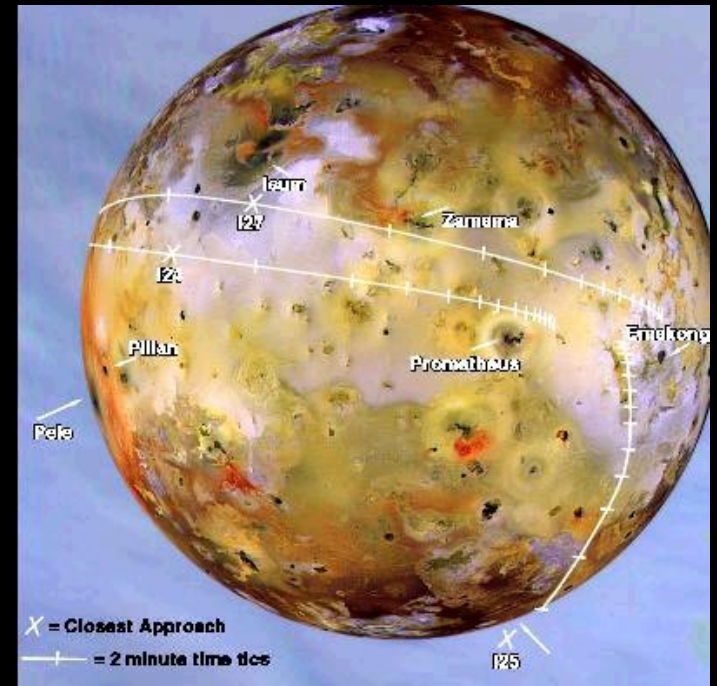


Jupiter's harsh magnetic environment presents quite a hazard to a spacecraft flying close to Io. When Galileo completed its close flybys in Winter 2000, the spacecraft received over two times the radiation dosage it was built to withstand.



# FLYING CLOSE TO IO

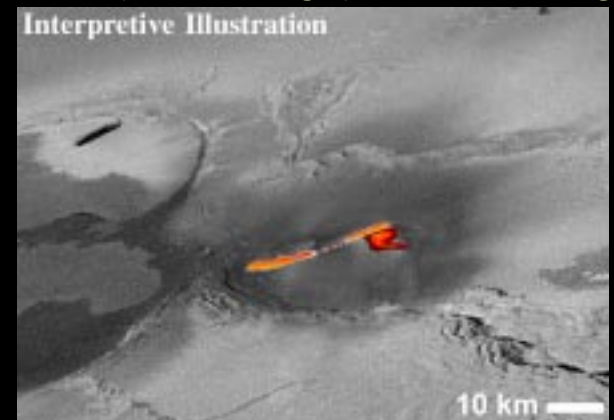
Close flybys of Io occurred on October 10 (I24), November 25 (I25), 1999 and February 22, 2000 (I27). Galileo passed as close to Io's surface as 198 kilometers (132 miles), revealing details on Io's surface as small as a city bus. This "high resolution" data also gave scientists a temperature map of Io, separating the "room temperature" sulfur from the hottest lava on the Solar System, and provide evidence to verify its composition.



Most of the hot material is distributed along a wavy line which is interpreted to be hot lava shooting more than 1.5 kilometers (1 mile high) out of a long crack, or fissure, on the surface.

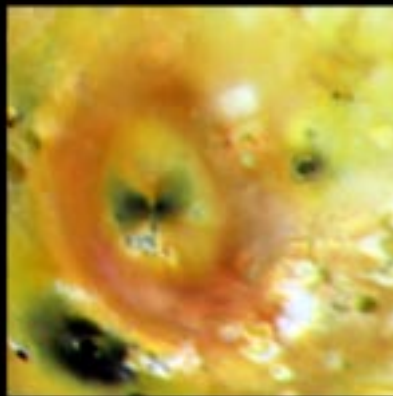
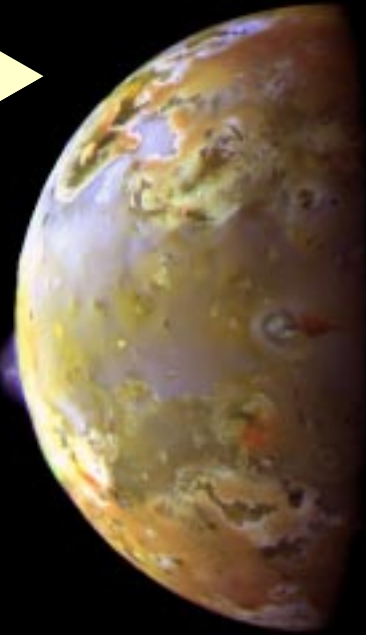


There also appear to be additional hot areas below this line, suggesting that hot lava is flowing away from the fissure. Initial estimates of the lava temperature indicate that it is well above 1,000 Kelvin (1,300 Fahrenheit) and might even be hotter than 1,600 Kelvin (2,400 Fahrenheit), so hot it caused "bleeding" to the camera.

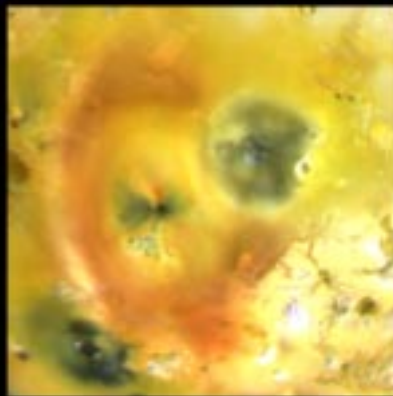


# VOLCANOES ON IO

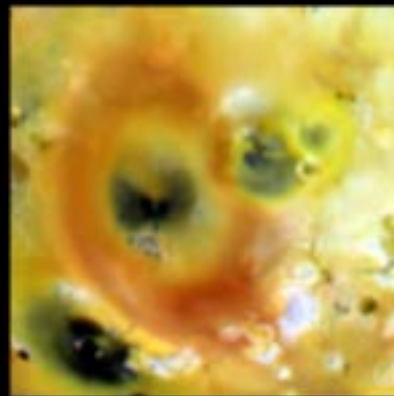
Jupiter's moon Io reigns supreme as the most volcanically active body in the Solar System, erupting 100 times more lava per year than all of Earth's volcanoes. Io's volcanoes can spew geyser-like plumes of sulfur dioxide gas 140 kilometers high, which turns to blue frost as it enters the frigid atmosphere. Here, the blue plume of Pillan Patera erupts on Io's limb, while the shadow of the plume of Prometheus is near the day-night boundary.



G7: April 1997



C10: September 1997



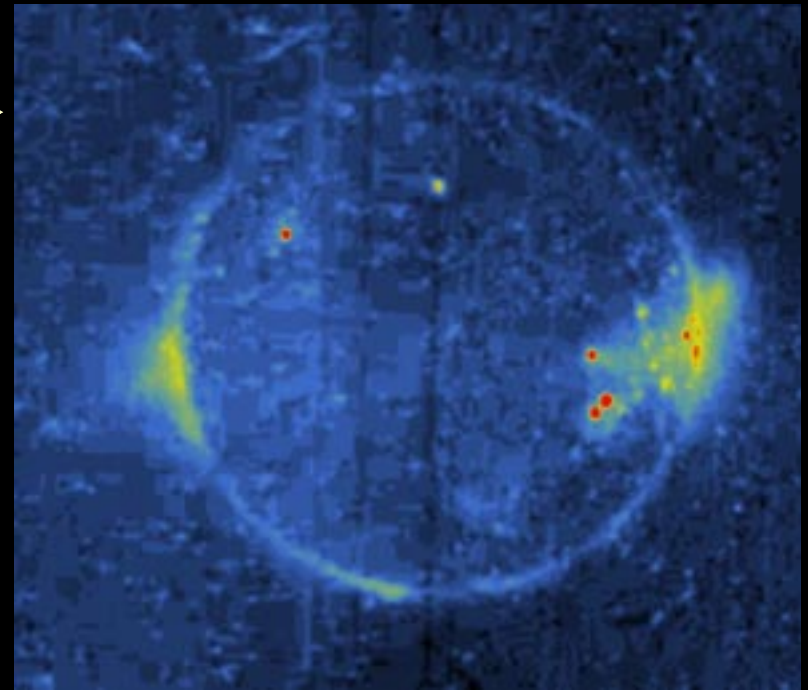
C21: July 1999

Plumes often leave deposits of red crystalline sulfur, which fade to yellow as they cool with time. Dark areas are probably silicate lava flows, which regularly change Io's surface, such as Pillan Patera in the middle right of these images.



# HOTTEST SURFACE AROUND

In places, Io has the hottest surface in the Solar System, except for the Sun. While Io is in Jupiter's shadow, intense hot spots glow in the dark, from red hot lavas of up to 3200° F. (The hottest lavas on Earth today are 2000° F.) Diffuse glows reach hundreds of kilometers higher than the plumes, leading to a patchy distribution of gas in the atmosphere.

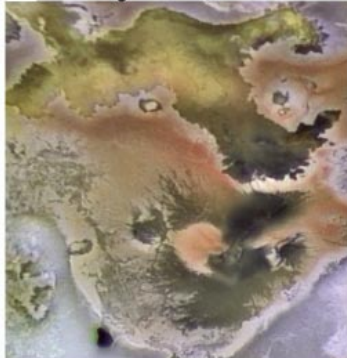


As it orbits, Io is tugged on by the other large moons of Jupiter, keeping the orbit from being circular and creating tides in Io's solid surface. The resulting friction generates the heat that powers Io's plentiful volcanoes.

Amaterasu, Loki



Lei-Kung Fluctus, Isum Patera



Prometheus, Culann



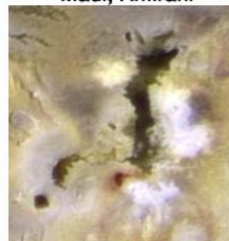
Marduk



Volund, Zamama



Maui, Amirani



Zal Patera



# COMPARING IO TO EARTH



Io's gravity is about 1/6 of Earth's (like our own moon) and the atmospheric pressure is only a tiny fraction of the Earth's—which allows Io's geyser-like plumes of sulfur to shoot to heights over five times the highest volcanic eruptions on Earth. If the Old Faithful geyser was on Io, it would shoot steam and water 35 kilometers high. Io's most common features are calderas and geysers, very similar to Yellowstone National Park.

Jupiter is the giant of our Solar System, containing twice as much mass as the rest of the Solar System. Of Jupiter's four large "Galilean" moons, Io is the closest to Jupiter. Io is about the size of Earth's moon, and would fit neatly inside the coasts of the US.

